We claim:

1. A method of forming high strength panels suitable for use in applications requiring a capability to withstand point compression loading without deformation, comprising the steps of:

providing a panel having elongated channels formed therein which are positioned along areas of anticipated point compression loading, said panel arranged and constructed to form an outside layer having a foam core therein;

providing structural foam channel inserts having an outer fabric layer and a foam core, wherein the channel inserts have a cross section which matches the cross-sectional profile of each of the elongated channels of the panel;

applying resin to at least mating portions of the outside layer of the panel and the outer fabric layer of the channel inserts;

positioning the channel inserts within the channels of the panel and allowing the resin to cure forming a composite structure.

2. The method of claim 1, wherein the panel is constructed by attaching a reinforcing fabric layer to non-woven fabric layer forming the outside layer.

3. The method of claim 1, wherein outer fabric layer of the structural foam channel inserts further comprises fabric flaps.

4. The method of claim 1, wherein the composite structure can resist deformation under conditions of point compression loading along an axis perpendicular to the panel surfaces.

5. The method of claim 1, wherein the foam core of the channel inserts and the panels are made of low-density urethane.

6. The method of claim 1, wherein the outer fabric layer of the structural foam inserts and the outside layer of the panel are arranged to continuously extend

between a first surface of the panel to a second surface of the panel, so as to traverse through the foam core.

7. The method of claim 6, wherein the mating portions of the outer fabric layer of the structural foam inserts and the outside layer of the panel form a rigid cross brace between the first panel surfaces and second panel surface after the resin on the mating portions is allowed to cure, wherein the rigid cross brace resists deformation under conditions of point compression loading applied along an axis perpendicular to the panel surfaces.

8. The method of claim 1, wherein the fabric layer is selected among the group of directional reinforcing fabric layers of organic or inorganic structural reinforcing fabrics consisting of fiberglass, carbon fibers, aramid fibers, linear polyurethane fibers, polypropylene fibers, or polyester fibers or any combination thereof.

9. The method of claim 1, wherein an inner fabric layer formed within the fabric layer is a non-woven fabric composed of continuous thermoplastic fiber, needle punched together to yield a felt-like fabric.

10. The method of claim 1, wherein an inner fabric layer formed within the fabric layer is composed of materials selected from the group including polyester staple mat, glass fiber mat, or other organic and inorganic fiber mats and fabrics.

11. The method of claim 1, wherein the foam core is formed of a self-expanding, self-curing urethane foam which has been caused to expand into the interstices of an inner one of the fabric layers by having been filled into a mold in an amount sufficient to cause pressure as a result of expansion of the foam cores to penetrate into the interstices of the inner fabric layer.

12. The method of claim 11, wherein the foam core is an MDI-based rigid polyurethane foam (methylene-diphenyl-methane diisocyanate) using "hydrogenated chlorofluorocarbons" (HCFC), water and/or CO_2 as a blowing agent.

13. A method of forming high strength panels suitable for use in applications requiring a capability to withstand point compression loading without deformation, comprising the steps of:

providing a panel by attaching a reinforcing fabric layer to a non-woven fabric layer forming an outside layer, wherein the outside layer forms opposing panel surfaces;

arranging a plurality of point compressive load bearing members between the opposing panel surfaces along areas of anticipated point compression loading, wherein the plurality of point compressive load bearing members forms elongated channels which are applied transversely to opposing surfaces of the panel; and

securing the plurality of point compressive load bearing members in place within the panel by injecting the panel with foam while constraining the opposing panel surfaces in providing a foam core to the panel.

14. The method of claim 13, wherein the method further comprises the step of allowing the foam to cure to form a composite article having an exposed reinforcing fabric layer.

15. The method in accordance to claim 14, wherein the composite article having an exposed reinforcing fabric layer is laminated into a larger composite structure.

16. The method of claim 13, wherein the outer layer of the point compressive load bearing member is selected from the group of materials including steel, aluminum or any other suitable metal or alloy.

17. The method of claim 13, wherein the outer layer of the point compressive load bearing member has a square cross-sectional profile.

18. The method of claim 13, wherein the outer layer of the point compressive load bearing member has a rectangular cross-sectional profile.

19. A composite structure, comprising:

a panel having elongated channels formed therein which are positioned along areas of anticipated point compression loading, wherein the panel is arranged and constructed by attaching a reinforcing fabric layer to a non-woven fabric layer forming an outside layer;

a plurality of structural foam channel inserts, each insert formed from attaching a reinforcing fabric layer to a non-woven fabric layer to form an outside layer, wherein the channel inserts have a cross section which matches the cross-sectional profile of each of the elongated channels of the panel;

a structural foam attached to the non-woven fabric layer of each of the panel and the plurality of structural foam channel inserts, wherein the structural foam fills interstices of the non-woven fabric layer without penetrating into the reinforcing fabric layer;

wherein the plurality of structural foam inserts are mated with the elongated channels of the panel after being saturated with curable resin after the structural foam has been attached to the non-woven fabric layer of each of the channel inserts and of the panel.

20. The composite structure of claim 19, wherein the composite structure is used to form a boat transom, wherein the composite structure further comprises

a plurality of fabric flaps positioned around the outer edges of the fabric layer of the panel to permit the boat transom to be laminated into a boat construction.